

Report Date: 03 Nov 2014

Summary Report for Individual Task
011-248-1103
Perform Manual Throttle Operations Full Authority Digital Electronic Control
Status: Approved

Distribution Restriction: Approved for public release; distribution is unlimited.

Destruction Notice: None

Foreign Disclosure: FD7 - This product/publication has been reviewed by the product developers in coordination with the Fort Rucker foreign disclosure authority. This product is NOT releasable to students from foreign countries.

Condition: In an OH-58D(R) helicopter with an IP, with the MMS off, during the day only, surface winds 20 knots or less, maximum gust spread of 10 knots , and no more than light turbulence. This task should not be trained in MOPP 4.

Standard:

1. Recognize the emergency and perform from memory, all immediate action procedures described in TM 1-1520-248-CL.
2. Maintain RPM Ng/Np 100 percent, 5 percent (95 to 105 percent).
 - a. Hover.
 - (1) Maintain heading 10 degrees. (2) Do not allow lateral drift to exceed 3 feet.
 - (3) Execute a smooth, controlled ascent and descent with minimal drift during takeoff and landing.
 - b. Cruise.
 - (1) Maintain altitude as directed 200 feet.
 - (2) Maintain airspeed as directed 10 KIAS. (3) Smoothly coordinate throttle and collective controls.
 - c. Approach to running landing:
 - (1) Select a suitable landing area. (2) Establish an approach angle to clear obstacles on final approach. (3) Maintain heading control and ground track alignment with the landing direction. (4) Execute a smooth and controlled touchdown with a running landing at or slightly above ETL.
 - d. Approach to a hover: (1) Select a suitable landing area.
 - (2) Establish an approach angle to clear obstacles on final approach.
 - (3) Decelerate through ETL no higher than 250 feet AGL and not lower than 100 feet AGL.
 - (4) Execute a smooth and controlled termination to a 3 to 5 foot hover.

Special Condition: None

Safety Risk: Medium

MOPP 4: Never

Task Statements

Cue: None

DANGER

None

WARNING

Underspeed below 93 percent rotor speed (Nr) can cause unrecoverable rates of descent. Instructor pilots (IPs) must be prepared to take corrective action anytime it becomes apparent the standards will be exceeded.

CAUTION

In case of an actual in-flight emergency that requires FADEC manual mode operation, the crew must use the procedures in TM 1-1520-248-10 or TM 1-1520-248-CL.

Remarks: None

Notes: The crew briefing conducted will include the following: If the IP takes the controls and announces "I have the controls" for any reason when the FADEC is in the MAN mode, the P will immediately prepare to place the FADEC switch to AUTO should the IP request that FADEC be placed back into the AUTO mode.

Performance Steps

1. Crew actions.

a. The crew must divide their attention to maintain airspace surveillance, obstacle avoidance, and maintain RPM within limits. The IP/P will inform the P* of all obstacles, confirm aircraft clearance during all turns and announce when focused inside the aircraft. The IP/P will provide adequate warning for corrective action to ensure operating limits are not exceeded. The IP/P will manipulate the FADEC auto/manual switch as required.

b. The crew should ensure cockpit communications are limited to the minimum consistent with safe conduct of the maneuver and appropriate aircrew coordination elements (announce/acknowledge actions).

c. The P* will coordinate with the IP/P for manipulation of the FADEC auto/manual switch. If in flight or at a hover the throttle will not be advanced to full open or if the aircraft is on the ground the throttle will remain at idle until the auto/manual switch is confirmed in auto mode and then the P* will announce "advancing throttle".

d. The IP/P will assist the P* as directed.

e. The following IP actions are required to ensure the safe outcome of the maneuver:

(1) The IP will keep his hand wrapped lightly around the throttle so that he can both feel and correct throttle inputs made by the P* while in the manual mode.

(2) The IP should always be aware of the rate at which throttle is applied once the NR is above 100 percent, never to exceed their own comfort level.

(3) The IP will ensure the aircraft is positioned over a suitable forced landing area when switching from automatic to manual mode.

(4) The IP will ensure the following is included in the crew briefing: If the IP takes the controls and announces "I have the controls" for any reason when the FADEC is in the MAN mode, the P will be prepared to place the FADEC switch to automatic (AUTO) should the IP request that FADEC be placed back into the AUTO mode.

(5) The IP will emphasize basic flying skills by teaching the P* to anticipate power and control requirements and, whenever possible, by separating those requirements in order to simplify the task being flown. For example if the P* needs to descend and decelerate, the P* should attempt to accomplish one and then the other (descend and then decelerate, or decelerate then descend). The P* should be taught to anticipate power changes and demands and to adjust the throttle and NR to lead those changes accordingly.

(6) The IP will ensure the suitability of the landing area and comply with Army Regulations and local requirements prior to initiating the maneuver.

(7) The IP will ensure that hover tasks are entered at no greater than a 5 foot hover, and if moving, then at a forward speed of no greater than 3 to 5 knots (normal walking pace) and over a level surface. The IP will also ensure that the area is suitable to attain a high hover if necessary during the initial phase of the emergency procedure. The conduct of this maneuver will be briefed by the IP in the vicinity of the intended area prior to performing it. Simply announcing the emergency immediately prior to execution does not fulfill this requirement.

(8) At a Hover-If during the performance of the procedure it becomes apparent that the aircraft will accelerate above ETL and enter free flight, the IP will recover the FADEC system to the AUTO mode and terminate the maneuver.

(9) The IP will conduct debriefing only after FADEC is returned to the auto mode.

(10) If at any time during manual throttle operations the P* allows the aircraft to get outside the following parameters, the IP will take the controls and terminate the maneuver:

(a) NR is greater than 105 percent or less than 95 percent. IP recovery may take place prior to these standards being exceeded depending on the rate of RPM increase/decrease.

(b) Any time the safe outcome of the maneuver is in jeopardy.

(11) If at any time during the approach the aircraft exceeds the following parameters, the IP will take the controls and terminate the maneuver:

(a) Aircraft decelerates below ETL above 250 feet AGL.

(b) Rate of descent is greater than 300 FPM below 100 feet AGL (Approach to a hover).

(c) Aircraft accelerates above ETL below 100 feet AGL (Approach to a hover).

(d) If it appears touchdown will be beyond the second one-third of the landing area.

2. Procedures. The FADEC system may fail to a fixed fuel flow mode or may fail directly to the manual mode. Regardless of the type of failure that occurs, it is imperative that the crew responds appropriately with the same published emergency procedure. In both failures, the failure will be accompanied by the FADEC audio tone. Immediate emergency procedure response to the audio tone is critical to success.

a. Ground.

(1) Begin on level ground at engine idle. The IP/P will place the FADEC AUTO/MAN switch to MAN and verify indications. After switching to MAN the IP will direct the P* to achieve/maintain 100 percent NR.

(2) The IP will then direct the P* to increase the collective while maintaining 100 percent NR and perform a takeoff from the ground, maintain an IGE hover, and perform left and right 360 degree turns. The IP will then direct the P* to land the aircraft and return the collective to the full down position, reduce the throttle to idle and return to the AUTO mode. The IP will ensure that the P* does not dump the collective when contact is made with the ground which will result in an overspeed.

b. Hover.

(1) FADEC failure at a hover-training. From an IGE hover in the AUTO mode, the IP will direct the P* to observe the throttle while the P* makes a throttle reduction to the appropriate position using the index mark for reference. Once the P* can make a smooth, quick reduction to the correct position while looking at the throttle, the IP will direct the P* to practice the initial reduction without looking and then glance down to "fine tune." The IP will place the FADEC switch from AUTO to MAN. The P* will react by making the necessary throttle and collective inputs to gain NR control and maintain it within standards. After the P* has established positive control of NR, hovering flight and landing from a hover may be practiced to teach correlation of throttle and collective inputs to changing power requirements.

(2) Respond to FADEC failure at a hover. From an IGE hover in the AUTO mode the IP/P will announce—"FADEC MANUAL" while simultaneously placing the FADEC AUTO/MAN switch to the MAN position. The P* will react to the FADEC warning audio tone by reducing the throttle to the index mark and smoothly adjusting the collective as necessary to gain control of the NR/NP. The P* will then instruct the P to identify the FADEC AUTO/MAN switch, and simulate pressing the AUTO/MAN switch, regardless of switch indication. The P* will then coordinate the throttle and collective as necessary to maintain NR/NP within limits and adjust the flight controls as necessary to land. Once the weight of the aircraft is firmly on the skids, the P* will reduce the throttle to the idle position, and then reduce the collective to the full down position to complete the landing. The IP will ensure that the P* does not dump the collective when contact is made with the ground which will result in an overspeed.

Note:

At a hover: if hover altitude has been maintained and RPM is allowed to droop, it is recommended to close the throttle and enter a hovering autorotation.

c. Cruise flight.

(1) FADEC failure in flight-training. While in level flight with cruise power applied at an altitude that will allow sufficient time to recover should the need arise. (The same approximate altitude that would be used to conduct a simulated engine failure at altitude would be appropriate. Not lower than 500 feet AGL.) The IP will direct the P* to maintain the collective position and reduce the throttle to the index mark. The crew will verify position of the throttle. The IP/P will place the FADEC AUTO/MAN switch to the MAN position and verify indications. The P* will smoothly adjust the collective as necessary to gain control of NR/NP and then adjust the throttle and collective as necessary to maintain NR/NP within limits. The IP will then instruct the pilot to accelerate and decelerate to directed airspeeds (not lower than 40 KIAS), climb and descend to directed altitudes (not lower than 500 feet AGL), and turn to directed headings while maintaining RPM within limits. After completing these maneuvers while the aircraft is in straight and level flight return to the AUTO mode.

(2) Respond to FADEC failure in flight. While in level flight with cruise power applied at an altitude that will allow sufficient time to recover should the need arise. (The same approximate altitude that would be used to conduct a simulated engine failure at altitude would be appropriate. Not lower than 500 feet AGL.) The IP/P will announce "FADEC MANUAL" while simultaneously placing the FADEC AUTO/MAN switch to the MAN position. The P* will react to the FADEC WARNING audio tone by reducing the throttle to the index mark and smoothly adjusting the collective as necessary to gain control of the NR/NP. The P* will then instruct the P to identify the FADEC AUTO/MAN switch, and simulate pressing the AUTO/MAN switch, regardless of switch indication. The P* will then coordinate the throttle and collective as necessary to maintain NR/NP within limits and adjust the flight controls as necessary for an approach and landing.

d. Approach and landing. Upon identifying the FADEC malfunction that has been initiated by the IP/P, the P* will react to maintain NR/NP within limits by adjusting the flight controls as necessary and ensure the FADEC AUTO/MAN switch is in the MAN position. The P* will maintain NR/NP within limits and select a suitable landing area. The P* should maneuver the aircraft so that it is at approximately 40 to 45 KIAS on final, and determine an approach angle which allows safe obstacle clearance to arrive at the intended point of landing. Once the approach angle is intercepted, coordinate throttle and collective to maintain appropriate approach angle and maintain operating limits. The exact approach angle and speed used during the approach will be dependent upon the suitability of the landing area and conditions. The final approach should be generally into the wind. The P* will complete the emergency procedure outlined in TM 1-1520-248-CL and if time permits will direct the IP/P to verify the procedures. Terminate the approach to a running landing or to a hover as described below.

(1) Approach to a running landing. Maintain apparent ground speed and rate of closure to arrive at approximately two feet above the intended touchdown area at or slightly above ETL. Reduce throttle to the engine idle position, (the throttle must be at the idle detent prior to touchdown or overspeed may occur), maintain heading with pedals, and apply collective to accomplish a smooth and controlled touchdown.

(2) Approach to a hover. Maintain apparent ground speed and rate of closure. Decelerate through ETL no higher than 250 feet AGL and not lower than 100 feet AGL regardless of the approach angle used. Once the P* negotiates ETL and the corresponding power change, the P* need only hover down the approach path to the desired termination point to a 3 to 5 foot hover.

Note:

In the manual mode the collective is the most effective means of controlling Ng due to reduced throttle response rates.

Note. A common tendency is to apply aft cyclic as the throttle is being reduced. The crew must be aware of this tendency and guard against it.

Note. While operating at a high torque requirement the index mark may not provide adequate fuel flow to maintain RPM within limits. Throttle should be initially reduced to the appropriate position for the current torque demand, but no lower than the index mark.

3. Additional IP/SP training. These role reversal exercises are designed to be performed ONLY by an IP or SP that are fully briefed on the task to be performed and are strictly designed to build confidence in the instructor pilot's ability to recover the aircraft.

a. IGE Hover (3 feet, ± 1 foot).

(1) Underspeed. While performing the procedures listed for respond to a failure at a hover, the IP/SP (P*) will begin to intentionally decrease the throttle until NR decreases to 95 percent. Extreme care shall be observed to not exceed any operating limits. As the IP(P) detects the underspeed condition, the IP(P) will retard the throttle to the idle stop and announce "Hovering Auto". The IP/SP(P*) will terminate the maneuver as Task 1072 terminates.

(2) Overspeed. While performing the procedures listed for respond to a failure at a hover, the IP/SP(P*) will begin to gradually increase the throttle until NR increases to 105 percent. After the IP(P) detects the overspeed condition, the IP(P) will announce "I have the controls" and increase collective then direct IP/SP(P) to place the FADEC AUTO/MAN switch to the AUTO position. Visually confirm AUTO is illuminated, once AUTO is visually confirmed, the IP(P*) shall return the throttle to the full-open position.

b. Flight.

(1) Underspeed. While performing the procedures listed for respond to a failure in flight, the IP/SP(P*) will begin to intentionally decrease the throttle until NR decreases to 95 percent. As the IP(P) detects the underspeed condition, the IP(P) will announce, "I have the controls," and smoothly adjust the throttle to the index mark (approximately 75 percent power level angle). The IP(P*) will adjust the collective as necessary to achieve NR of 96 percent or greater and direct the IP/SP(P) to place the FADEC AUTO/MAN switch in the AUTO mode. Once the IP(P*) has visually confirmed FADEC is in AUTO, the IP(P*) will open the throttle to the full-open position, and terminate the maneuver.

(2) Overspeed. While performing the procedures listed for respond to a failure in flight, the IP/SP(P*) will begin to gradually increase the throttle until NR increases to 105 percent. After the IP(P) detects the overspeed condition, the IP(P) will announce "I have the controls" and increase collective then direct IP/SP(P) to place the FADEC AUTO/MAN switch to the AUTO position. Visually confirm AUTO is illuminated, once AUTO is visually confirmed, the IP(P*) shall return the throttle to the full-open position, and terminate the maneuver.

c. The intent of these exercises is to demonstrate an appropriate recovery technique to an unintentional overspeed/underspeed condition during FADEC manual throttle training.

(Asterisks indicates a leader performance step.)

Evaluation Guidance:

Evaluations will be conducted in the aircraft. For the approach and landing crewmembers must demonstrate proficiency to terminate with both a running landing and a VMC approach to a hover.

Evaluation Preparation: 1. Training will be conducted in the aircraft. This task is intended to be progressive in nature. IPs should not continue to more demanding elements of the task until the crewmember demonstrates proficiency.

2. Only the following maneuvers may be performed while conducting FADEC manual mode training/evaluations:

- a. Hovering flight.
- b. VMC flight maneuvers.
- c. VMC approach to a hover.
- d. Running landing as described in the procedure.

PERFORMANCE MEASURES	GO	NO-GO	N/A
1. Recognized the emergency and performed from memory, all immediate action procedures described in TM 1-1520-248-CL.			
2. Maintained RPM NR/NP 100 percent, ± 5 percent (95 to 105 percent).			
a. Hover.			
(1) Maintained heading ± 10 degrees.			
(2) Did not allow lateral drift to exceed ± 3 feet.			
(3) Executed a smooth, controlled ascent and descent with minimal drift during takeoff and landing.			
b. Cruise flight.			
(1) Maintained altitude as directed ± 200 feet.			
(2) Maintained airspeed as directed ± 10 KIAS.			
(3) Smoothly coordinated throttle and collective controls.			
c. Approach to running landing:			
(1) Selected a suitable landing area.			
(2) Established an approach angle to clear obstacles on final approach.			
(3) Maintained heading control and ground track alignment with the landing direction.			
(4) Executed a smooth and controlled touchdown with a running landing at or slightly above ETL.			
d. Approach to a hover:			
(1) Selected a suitable landing area.			
(2) Established an approach angle to clear obstacles on final approach.			
(3) Decelerated through ETL no higher than 250 feet AGL and not lower than 100 feet AGL.			
(4) Executed a smooth and controlled termination to a 3 to 5 foot hover.			

Supporting Reference(s):

Step Number	Reference ID	Reference Name	Required	Primary
	EM 0058	Helicopter, Kiowa Warrior, OH-58D (Current as of 1 Aug 12)	No	No
	TM 1-1520-248-10 (Obsoleted)	(Obsoleted, use the one dated 30 Apr 13) OPERATORS MANUAL FOR ARMY OH-58D HELICOPTER	No	No
	TM 1-1520-248-CL	OPERATORS AND CREWMEMBERS CHECKLIST FOR ARMY OH-58D HELICOPTER	No	No
	TM 1-1520-248-MTF	MAINTENANCE TEST FLIGHT FOR ARMY OH-58D HELICOPTER	No	No

Environment: Environmental protection is not just the law but the right thing to do. It is a continual process and starts with deliberate planning. Always be alert to ways to protect our environment during training and missions. In doing so, you will contribute to the sustainment of our training resources while protecting people and the environment from harmful effects. Refer to FM 3-34.5 Environmental Considerations and GTA 05-08-002 ENVIRONMENTAL-RELATED RISK ASSESSMENT.

Safety: In a training environment, leaders must perform a risk assessment in accordance with ATP 5-19, Risk Management. Leaders will complete the current Deliberate Risk Assessment Worksheet in accordance with the TRADOC Safety Officer during the planning and completion of each task and sub-task by assessing mission, enemy, terrain and weather, troops and support available-time available and civil considerations, (METT-TC). Note: During MOPP training, leaders must ensure personnel are monitored for potential heat injury. Local policies and procedures must be followed during times of increased heat category in order to avoid heat related injury. Consider the MOPP work/rest cycles and water replacement guidelines IAW FM 3-11.4, Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological, and Chemical (NBC) Protection, FM 3-11.5, Multiservice Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Decontamination.

Prerequisite Individual Tasks : None

Supporting Individual Tasks : None

Supported Individual Tasks :

Task Number	Title	Proponent	Status
011-248-1103	Respond to Full Authority Digital Electronic Control Failure	011 - Aviation (Individual)	Superseded
011-248-1104	Perform Full Authority Digital Electronic Control Recovery Procedures	011 - Aviation (Individual)	Analysis

Supported Collective Tasks : None